



***High Resolution,
High Contrast***

Permanent Item Marking

**Mike Weaver
Intrinsic Marks International, LLC**

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Presentation Topics

- ***Capability overview***
- ***Example DPM applications***
- ***TherMark® process overview***
- ***Inspection of samples***
- ***Hands on demonstrations***

Presentation
Outline



Long Term
Tracking
Solutions

Work-in-
Process
Tracking
Solutions

Capability Overview

UID – Universal Identifiers

DPM - Direct Part Marking

SIM – Serial Item Marking

Burr Tags with Barcodes



Capability Overview

- **High Resolution**
- **High Contrast**
- **Quick to Mark**
- **Permanent***

* as permanent as the substrate material carrying the mark



Permanent UID Marking Nameplate

- MIL-STD-130L
- 2D is ISO/IEC 15418 & 15434 Compliant
- Stainless steel nameplate
- High resolution, high contrast

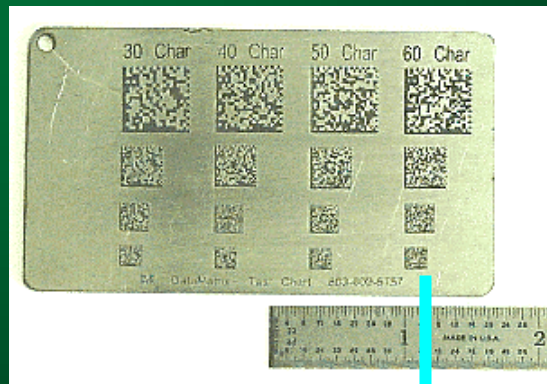


- High Resolution
- High Contrast
- Quick to Mark
- Permanent*

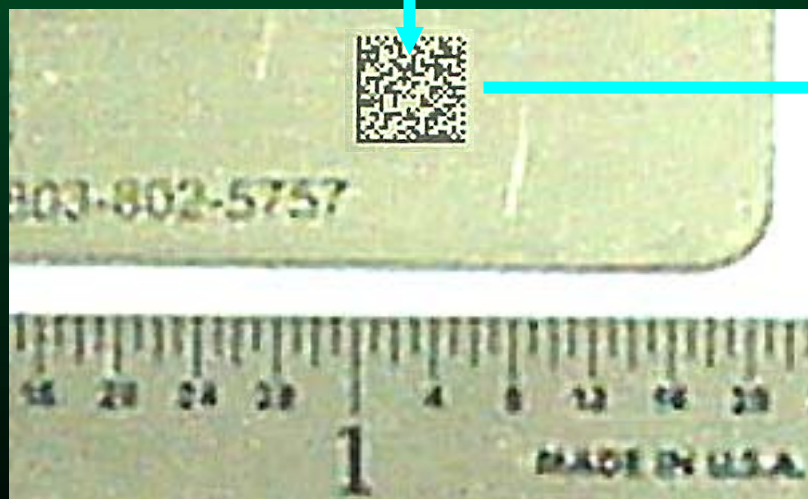


IMI Test Grid, 304 Stainless, LMM 14

30, 40, 50, 60 ASCII characters



60 ASCII in
3/16"
DataMatrix



- High Resolution
- High Contrast
- Quick to Mark
- Permanent*



Permanent ID Marking Medical Instruments

- Stainless Steel
- Gold plated
- Micro-biological safe
- Sterilization cycle safe & durable



- High Resolution
- High Contrast
- Quick to Mark
- Permanent*

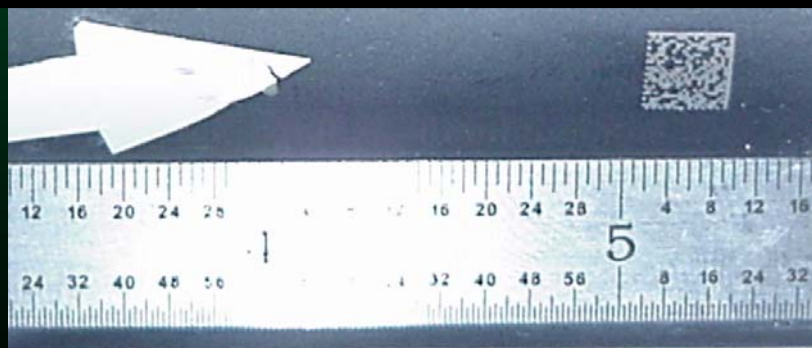


Permanent UID Marking Parkerized Coatings

- M-16 lower receiver
- UID reverse color marking
- Durable under field conditions
- High resolution, high contrast



[>Rs06GsN7310012456937Gs6PC4545Rs07Gs36M27121-008GsRsEOT



- High Resolution
- High Contrast
- Quick to Mark
- Permanent*



Permanent Burr Tags Tracking Work Orders

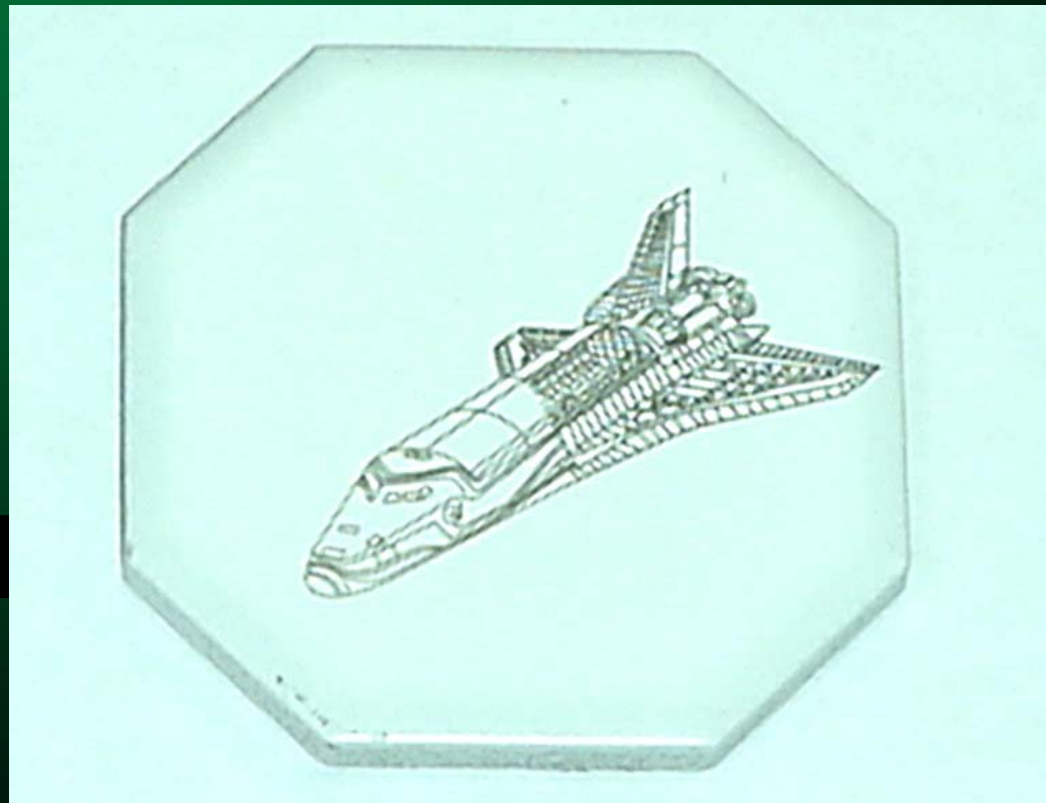
- Human readable word order information
- Code 3 of 9 tracking barcode
- Tested: 900° F, acids, solvents & shot peen
- High resolution, high contrast
- Read with current DoD barcode scanners



- High Resolution
- High Contrast
- Quick to Mark
- Permanent*



Ceramic Tile AutoCAD Line Drawing



- High Resolution
- High Contrast
- Quick to Mark
- Permanent*



What makes TherMark unique?

The patented* **TherMark™** process is a:

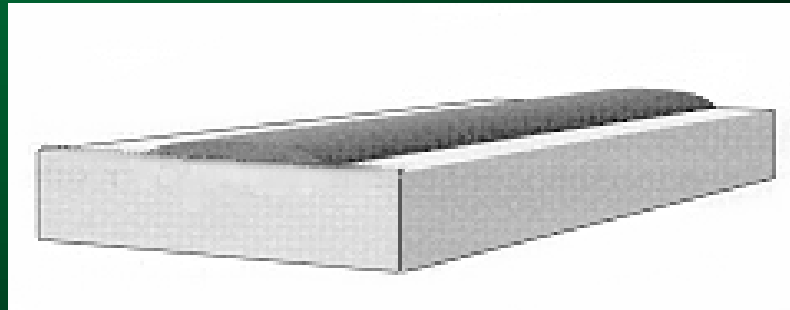
1. chemically based,
2. thermally activated,
3. low power laser printing technology
which quickly produces
4. permanent marks on many hard surface materials
5. without the normal surface damage associated with laser marking.

Unique
TherMark
Technology

* USA patents 6,075,223 & 6,313,436; others pending in USA and internationally



TherMark Laser Additive Bonding



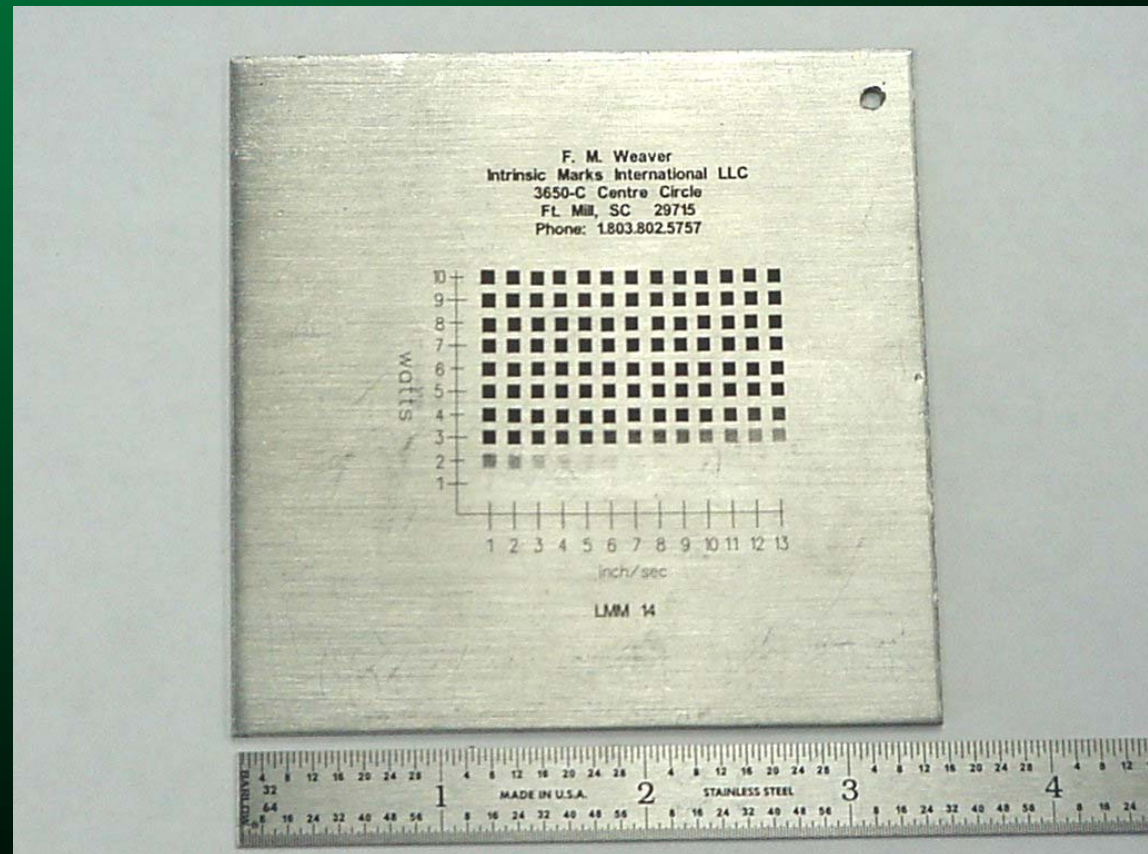
Overview

Laser Marking Material Bonded To The Surface



TherMark Process

Laser Power vs Laser Beam Speed



W vs. ips



TherMark Process

Coat surface with TherMark LMM*

Laser bonds pattern details

Remove excess LMM

*Laser Marking Material

Simple as
1, 2, 3



TherMark Process

Laser Marking

Coat Surface with
LMM material

Laser traces
pattern on item
at 1,500°+ F to bond

Remove excess
LMM material



Simple as
1, 2, 3



TherMark Advantages

- Excellent marking resolution (0.003")
- High contrast for easy reading (black)
- Fast marking speeds*
- Permanent direct item marks**

* directly related to the substrate material being marked & laser power used

** as permanent as the substrate material carrying the mark

- High Resolution
- High Contrast
- Quick to Mark
- Permanent*



TherMark Advantages

- Barcode marks read by standard equipment
- Substrate integrity (min. thermal stress)
- Cost effective markings (\$0.01 - \$0.08 / sq in)
- Lowest life cycle cost per part (permanent!)

- High Resolution
- High Contrast
- Quick to Mark
- Permanent*



Partial List of TherMark Materials Marked

Uncoated Materials

Aluminum
Brass
Copper
Stainless Steel
Titanium
Gold
Glass
Ceramics

Coated Materials

Anodized Aluminum
Nickel Plated
Chrome Plated
Parkerized coating

Materials
marked by
TherMark
technology



Environmentally Safe

The TherMark proprietary laser marking materials are lead and cadmium-free* water based products which are environmentally friendly and easy to use, clean up and recycle excess.

Environmentally
Safe

TherMark
Marking
Materials

* The ceramic red and yellow marking materials contain cadmium



More Examples of Marked Items

Permanent
Marking
Solutions



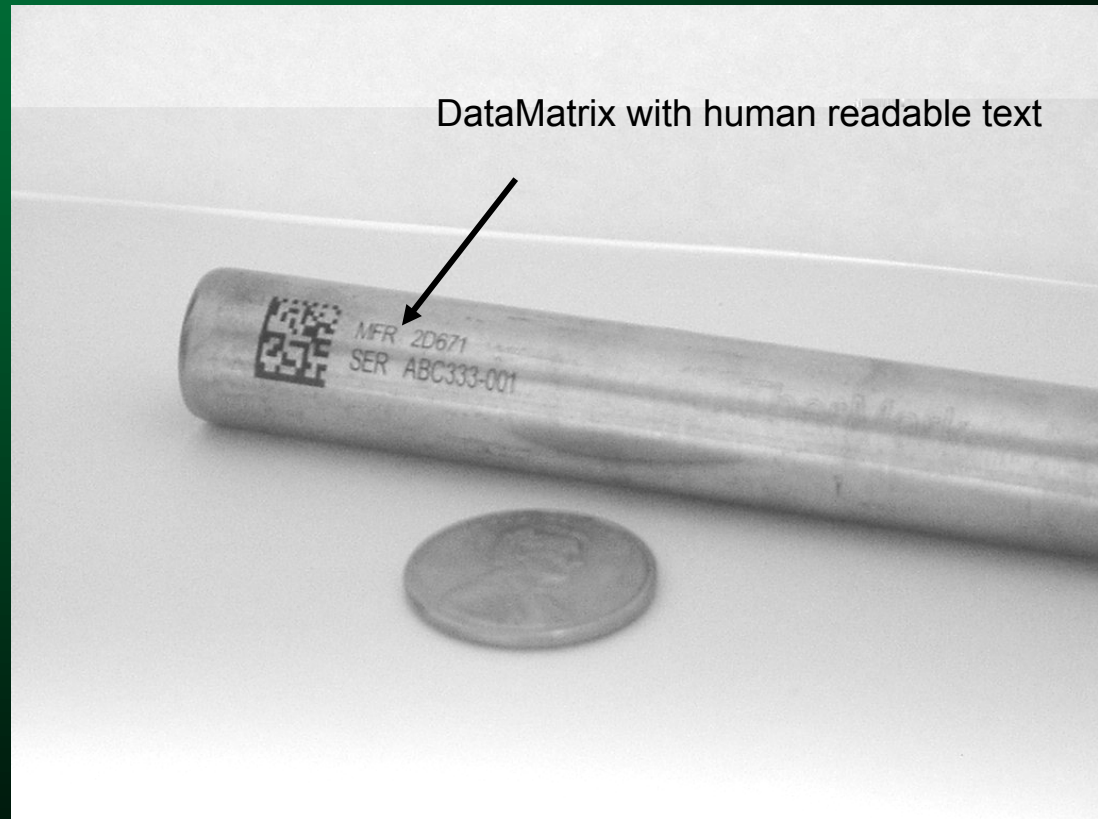
Example TherMark Markings



Permanently
Mark Many
Types and
Shapes of
Parts



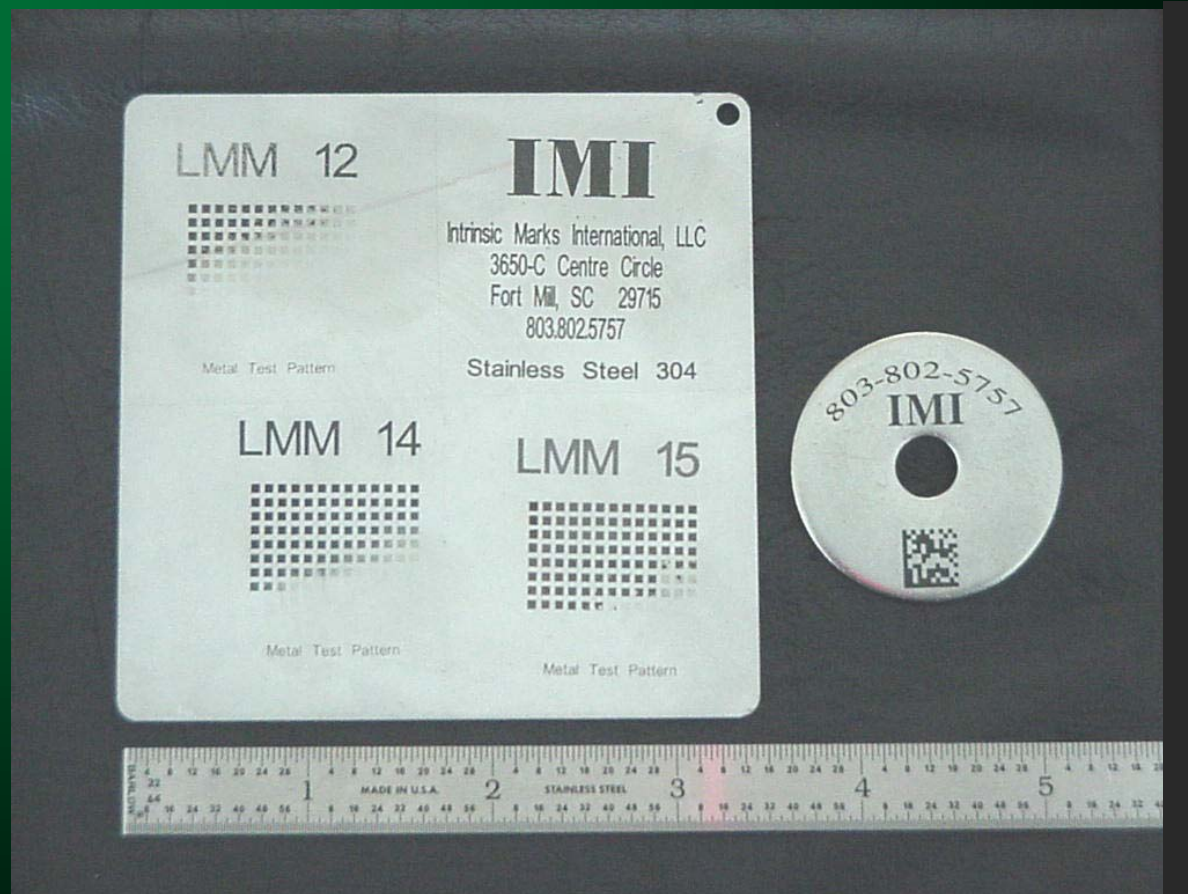
Example TherMark Markings



Read
Standard
Barcodes
With
Standard
Readers



Example TherMark Markings



Sample
TherMark
Grids
& Washer

Power vs. Speed Grids

Sample Stainless Washer



IMI-TherMark Burr Tag Tested for Durability

- Solvents – Engine Part Cleaning
- Solvents – Aircraft Part Cleaning
- Acid Solutions
- High temperature (900° F)
- Physical abuse (shot peen)

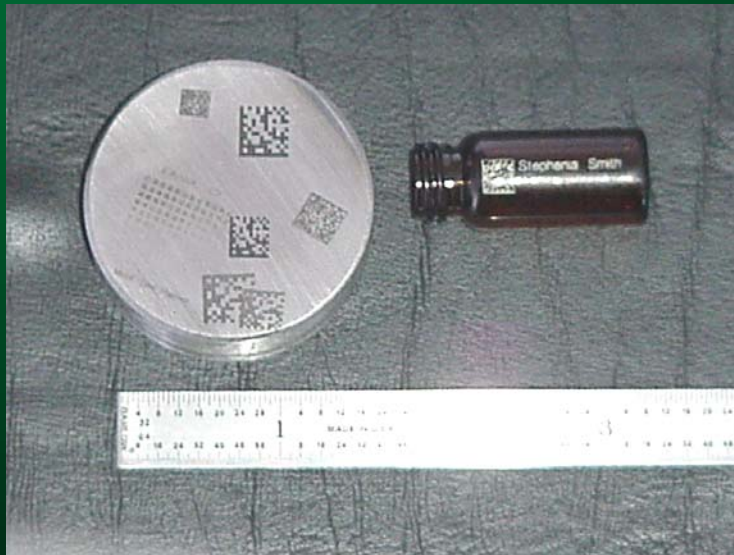
Permanent
Marking
Solutions





Example TherMark Markings

Wide variety
of substrates
marked



Titanium Alloy, Glass Bottle and HDPC Plastic Markings



Marking Tool Options

IMI Laser Printing Systems

- **Desktop Direct Part Marking Systems**
- **Mobile Direct Part Marking Systems**
- **Unattended Burr Tag Printing Systems**
- **Production Line Marking Systems**
- **Custom Direct Part Marking Systems**

Tools to meet
marking
needs



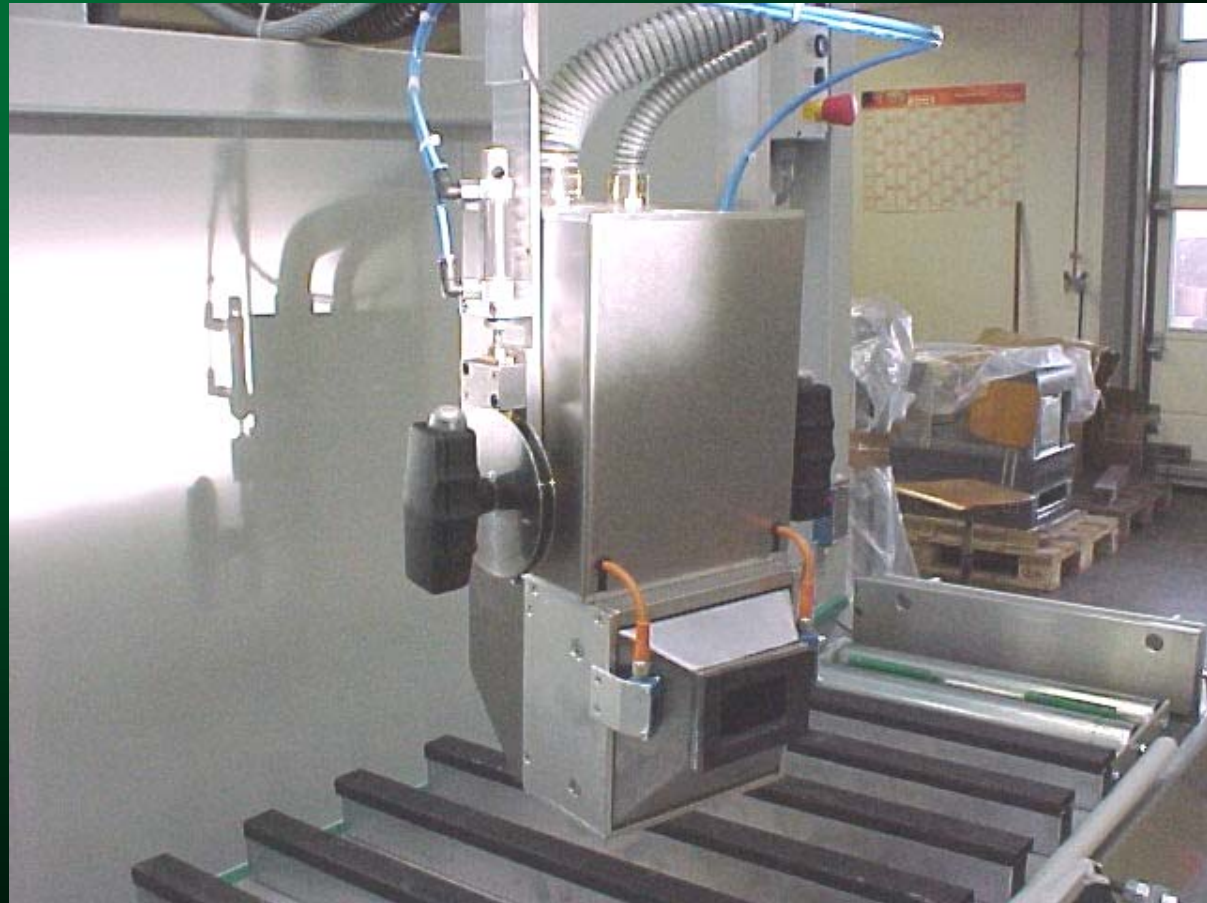
IMI Laser Printing Systems Desktop Unit



Small Batch
Burr Tag
Printing
System



IMI Laser Printing Systems Production Line Marking



Class IV
production
line
TherMark
laser

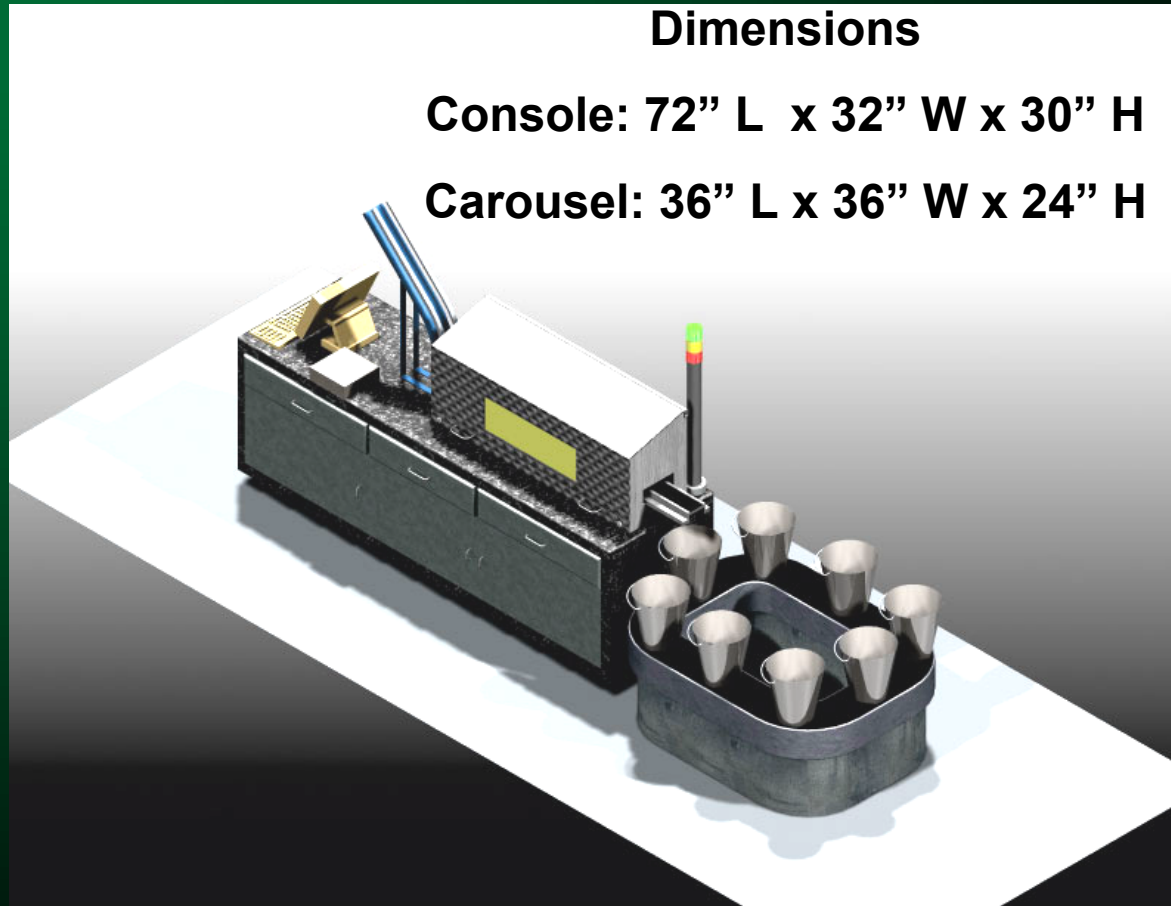


IMI Laser Printing Systems Automated Unit

Dimensions

Console: 72" L x 32" W x 30" H

Carousel: 36" L x 36" W x 24" H

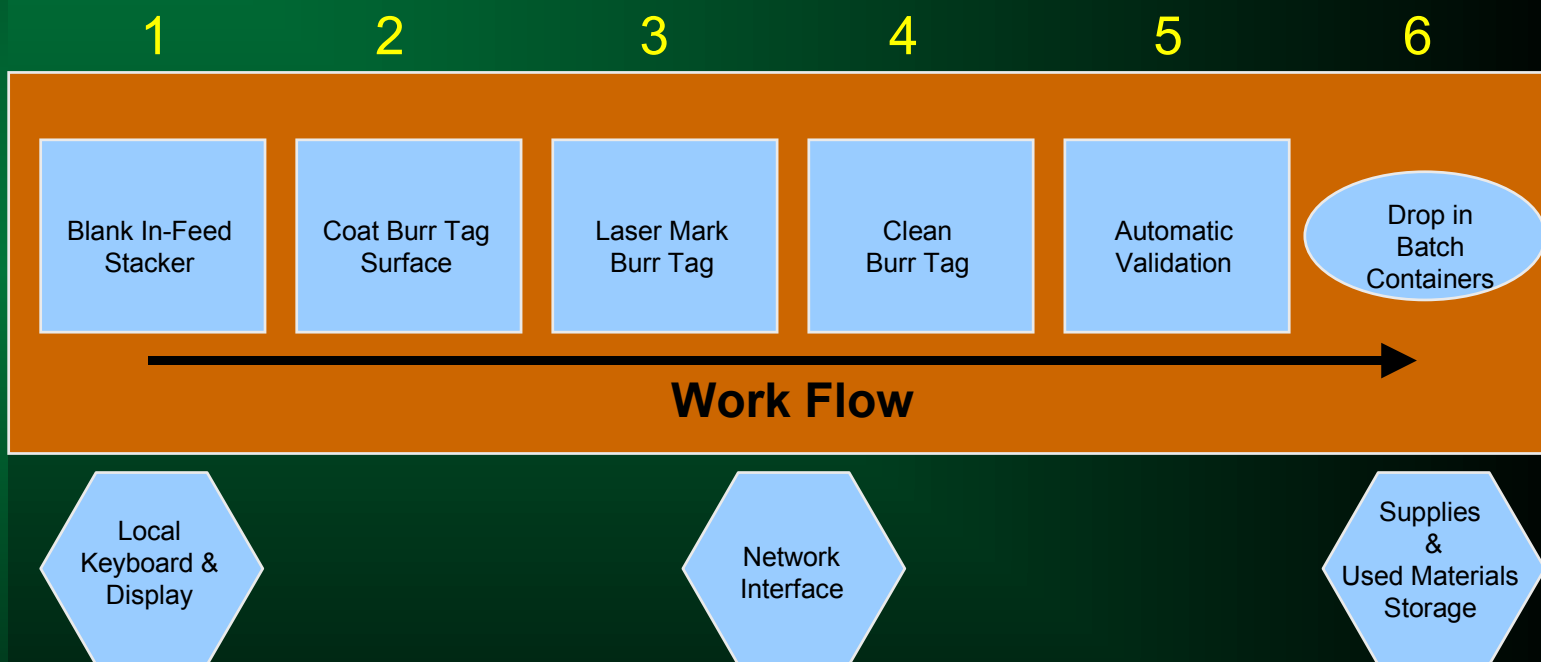


**Unattended
Burr Tag
Printing
System**



IMI Laser Printing Systems

Unattended Burr Tag Printing



**Volume
permanent
printing tool
for burr tag
production**



Summary

IMI-TherMark UID Direct Part Marking

- **High Resolution**
- **High Contrast**
- **Very Durable**
- **Cost Effective per Mark**
- **Very Flexible Printing Content**
- **Desktop to Production Line Systems**

Tools to meet
marking
needs



***Samples,
Literature
&
Demonstrations
at
IMI Display Table***

Permanent
Marking
Solutions



Questions & Answers

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High Resolution, High Contrast Permanent Item Marking

IMI-TherMark

Mike Weaver, CEO
Intrinsic Marks International, LLC
3650-C Centre Circle
Fort Mill, SC 29715 USA
Tel: 803-802-5757offices
Email: FMWeaver@IntrinsicMarks.com
Visit: www.IntrinsicMarks.com

“Lifetime ID MarksSM”